Listing of Claims

The following listing of claims will replace all prior versions, and listings, of claims in the application:

Claims:

1. (Currently amended) A Wi-Fi switch comprising:

a multi-beam directed signal system configured for 802.11 specification data packet wireless computing communication with a 802.11 client computing device; and

an antenna assembly configured to receive and emanate wireless communication within a directed beam with the computing device,

wherein the multi-beam directed signal system is configured to determine and adjust, by complementary beam-forming to increase ~~side lobe levels~~ radiation levels of the nulls outside of the directed beam, a transmission peak for a particular directed beam in a non-omni-directional manner based on operational information associated with signal routing and further configured to direct a transmission null in a particular direction to maximize power associated with the transmission peak and minimize interference in the particular direction.

2. (Previously presented) A Wi-Fi switch as recited in claim 1, wherein the multi-beam directed signal system is further configured to generate a second directed wireless computing communication to a second 802.11 client computing device and wherein the antenna assembly is further configured to receive the second wireless

communication and emanate a second directed computing communication beam for additional data communication with the second computing device.

3. (Previously presented) A Wi-Fi switch as recited in claim 1, wherein:

the multi-beam directed signal system is further configured to generate a second directed wireless computing communication to a second 802.11 client computing device;

the antenna assembly is further configured to receive the second wireless computing communication and emanate a second directed communication beam for additional data communication with the second computing device; and

the antenna assembly is further configured to emanate the directed communication beam such that only the computing device will receive the data communication, and further emanate the second directed communication beam such that only the second computing device will receive additional data communication.

4. (Previously presented) A Wi-Fi switch as recited in claim 1, wherein:

the multi-beam directed signal system is multi-channel and further configured for directed wireless computing communication with a second 802.11 client computing device;

the antenna assembly is further configured to emanate the directed communication beam for data communication with the computing device via a first channel; and

the antenna assembly is further configured to emanate a second directed communication beam for additional data communication with the second computing device via a second channel.

5. (Previously presented) A Wi-Fi switch as recited in claim 1 wherein:

the multi-beam directed signal system is multi-channel and further configured for directed wireless computing communication with a second 802.11 client computing device;

the antenna assembly includes a phased array of antenna elements each configured to emanate a directed communication beam;

the antenna assembly is further configured to emanate the directed communication beam from a first antenna element for the data communication with the computing device via a first channel; and

the antenna assembly is further configured to emanate a second directed communication beam from a second antenna element for additional data communication with the second computing device via a second channel.

6. (Previously presented) A Wi-Fi switch as recited in claim 1, wherein:

the multi-beam directed signal system is multi-channel and further configured for simultaneous directed wireless computing communication with a second 802.11 client computing device;

the antenna assembly is further configured to emanate the directed communication beam for data communication transmission to the computing device via a first channel; and

the antenna assembly is further configured to emanate a second directed communication beam for data communication reception from the second computing device via a second channel.

7. (Previously presented) A Wi-Fi switch as recited in claim 1, wherein the multi-beam directed signal system is further configured for simultaneous directed wireless transmission to the computing device and directed wireless reception from a second 802.11 client computing device.

8. (Previously presented) A Wi-Fi switch as recited in claim 1, wherein the antenna assembly is further configured to emanate the directed wireless communication beam as an electromagnetic signal that includes transmission peaks and transmissions nulls within a coverage area of the communication beam.

9. (Previously presented) A Wi-Fi switch as recited in claim 1, wherein:

the antenna assembly is further configured to emanate the directed wireless communication beam as an electromagnetic signal that includes a signal transmission peak within a first coverage area and a signal transmission null within a second coverage area; and

the antenna assembly is further configured to emanate a second directed wireless communication beam as a second electromagnetic signal that includes a second signal transmission peak within the second coverage area and a second signal transmission null within the first coverage area.

10. (Previously presented) A Wi-Fi switch as recited in claim 1, wherein the antenna assembly is further configured to emanate a second directed wireless communication beam for the data communication with the computing device when the directed wireless communication beam is determined ineffective for data communication.

11. (Previously presented) A Wi-Fi switch as recited in claim 1, wherein:

the multi-beam directed signal system is further configured to determine when the directed wireless communication beam is ineffective for data communication with the computing device, and is further configured to generate the directed wireless communication for the data communication via a second directed wireless communication beam; and

the antenna assembly is further configured to emanate the second directed wireless communication beam for the data communication with the computing device.

12. (Currently amended) A Wi-Fi switch as recited in claim 1, wherein the antenna assembly is further configured to emanate multiple directed communication beams, and wherein the multi-beam directed signal system includes signal [[ ]] coordination logic that monitors the multiple directed communication beams each as an individual access point.

13. (Previously presented) A Wi-Fi switch as recited in claim 1, wherein the multi-beam directed signal system includes signal coordination logic that controls a directed wireless transmission to the computing device and directed wireless reception from a second computing device such that the directed wireless transmission does not interfere with the directed wireless reception.

14-15. (Cancelled).

16. (Currently amended) A method, comprising:

generating from a Wi-Fi switch a directed wireless communication for 802.11 specification data packet communication with a 802.11 client computing device;

receiving the directed wireless communication at an antenna assembly;

emanating a directed communication beam, associated with a transmission peak, which is adjusted relative to other beams of a multi-beam directed signal system by complementary beam-forming to increase ~~side lobe levels~~ radiation levels of the nulls outside of the directed beam, in a non-omni-directional manner, for the data communication with the computing device; and

directing a transmission null in a particular direction to maximize power associated with the transmission peak and minimize interference in the particular direction.

17. (Currently amended) A method as recited in claim 16, further comprising:

generating a second directed wireless communication for additional data communication with a second computing device;

receiving the second directed wireless communication at the antenna assembly; and

emanating a second directed communication beam, adjusted for a second transmission peak[[)]], for the additional data communication with the second computing device.

18. (Previously presented) A method as recited in claim 16, further comprising:

generating a second directed wireless communication for additional data communication with a second computing device;

receiving the second directed wireless communication at the antenna assembly;

emanating a second directed communication beam, adjusted for a second transmission peak, for the additional data communication with the second computing device; and

wherein the directed communication beam is emanated such that only the computing device will receive the data communication, and the second directed communication beam is emanated such that only the second computing device will receive additional data communication.

19. (Previously presented) A method as recited in claim 16, further comprising:

generating a second directed wireless communication for additional data communication with a second computing device;

receiving the second directed wireless communication at the antenna assembly;

emanating a second directed communication beam, adjusted for a second transmission peak, for the additional data communication with the second computing device; and

wherein the directed communication beam is emanated from a first antenna element of the antenna assembly, and the second directed communication beam is emanated from a second antenna element of the antenna assembly.

20. (Previously presented) A method as recited in claim 16, further comprising emanating a second directed communication beam, adjusted for a second transmission peak, for data communication reception from a second computing device, and wherein

emanating the directed communication beam includes emanating the directed communication beam for data communication transmission to the computing device.

21. (Previously presented) A method as recited in claim 16, further comprising: transmitting the data communication to the computing device via the directed communication beam adjusted for a transmission peak;

receiving a second data communication from a second computing device via a second directed communication beam; and

wherein transmitting the data communication and receiving the second directed data communication is simultaneous.

22. (Previously presented) A method as recited in claim 16, wherein emanating the directed communication beam includes emanating an electromagnetic signal that includes transmission peaks along a signal path during data communication with the computing device and transmissions nulls in another direction within a coverage area of the directed communication beam.

23. (Previously presented) A method as recited in claim 16, further comprising: determining that the directed communication beam is ineffective for the data communication with the computing device; and

emanating a second directed communication beam for the data communication with the computing device.

24. (Previously presented) A method as recited in claim 16, further comprising:

transmitting the data communication to the computing device via the directed communication beam;

receiving a second data communication from a second computing device via a second directed communication beam; and

controlling transmitting the data communication such that the data communication does not interfere with receiving the second data communication.

25. (Withdrawn) A multi-beam directed signal system, comprising:

signal coordination logic configured to coordinate directed wireless communication with client devices;

a transmit beam-forming network configured to route data communication transmissions to one or more of the client devices via directed communication beams that are emanated from an antenna assembly; and

a receive beam-forming network configured to receive data communication receptions from one or more of the client devices via the directed communication beams.

26. (Withdrawn) A multi-beam directed signal system as recited in claim 25, further comprising:

receiver/transmitters each configured to transmit a data communication transmission to one or more of the client devices, and each further configured to receive a data communication reception from one or more of the client devices;

wherein the transmit beam-forming network includes transmit ports that each couple an individual antenna element of the antenna assembly to a receiver/transmitter; and

wherein the receive beam-forming network includes receive ports that each couple an individual antenna element of the antenna assembly to a receiver/transmitter.

27. (Withdrawn) A multi-beam directed signal system as recited in claim 25, further comprising:

multiple channels each corresponding to a receiver/transmitter configured to transmit a data communication transmission to a client device and receive a data communication reception from the client device; and

a scanning receiver configured to receive a data communication reception from a client device and determine which of the multiple channels provides acceptable data communication transmission and reception with the client device.

28. (Withdrawn) A multi-beam directed signal system as recited in claim 25, further comprising a scanning receiver configured to scan the directed communication beams and monitor for the data communication receptions from one or more of the client devices.

29. (Withdrawn) A multi-beam directed signal system as recited in claim 25, further comprising:

a memory component configured to maintain information corresponding to one or more of the client devices, the information including at least one of a transmit power level, a data transmit rate, an antenna direction, quality of service data, and timing data; and

wherein the signal coordination logic is further configured to coordinate the directed wireless communication with one or more of the client devices based on the information maintained with the memory component.

30. (Withdrawn) A multi-beam directed signal system as recited in claim 25, further comprising medium access controllers each corresponding to a directed communication beam and configured to communicate data packets for the directed wireless communication between the multi-beam directed signal system and a communication network.

31. (Withdrawn) A multi-beam directed signal system as recited in claim 25, wherein the transmit beam-forming network is further configured to transmit energy on a side lobe of a directed communication beam corresponding to a first client device such that a second client device will detect the side lobe energy and recognize that a data communication transmission is being emanated to the first client device via the directed communication beam.

32. (Withdrawn) A multi-beam directed signal system as recited in claim 25, wherein the signal coordination logic is further configured to coordinate that only a first client device will receive a first directed wireless communication via a first communication beam, and that only a second client device will receive a second directed wireless communication via a second communication beam.

33. (Withdrawn) A multi-beam directed signal system as recited in claim 25, wherein the signal coordination logic is further configured to coordinate a simultaneous data communication transmission to a first client device via a first directed

communication beam and a data communication reception from a second client device via a second directed communication beam.

34. (Withdrawn) A multi-beam directed signal system as recited in claim 25, wherein:

the signal coordination logic is further configured to determine when a directed communication beam is ineffective for a data communication transmission to a client device; and

the transmit beam-forming network is further configured to route the data communication transmission to the client device via a second directed communication beam.

35. (Withdrawn) A multi-beam directed signal system as recited in claim 25 wherein the signal coordination logic is further configured to monitor the directed communication beams each as an individual access point.

36. (Withdrawn) A multi-beam directed signal system as recited in claim 25, wherein the signal coordination logic is further configured to coordinate a data communication transmission to a first client device and a data communication reception from a second client device such that the data communication transmission does not interfere with the data communication reception.

37. (Withdrawn) A Wi-Fi switch comprising the multi-beam directed signal system as recited in claim 25.

38. (Withdrawn) A Wi-Fi switch for 802.11 specification data packet communication comprising the multi-beam directed signal system as recited in claim 25.

39. (Withdrawn) A method comprising:

coordinating directed wireless communication with client devices via directed communication beams emanated from an antenna assembly;

routing data communication transmissions through a transmit beam-forming network to antenna elements of the antenna assembly such that a data communication transmission is communicated to a client device via a directed communication beam; and

receiving data communication receptions through a receive beam-forming network from the antenna elements of the antenna assembly such that a data communication reception is received from a client device via a directed communication beam.

40. (Withdrawn) A method as recited in claim 39, further comprising:

receiving a data communication reception from a client device with a scanning receiver; and

determining which of multiple channels provides acceptable data communication transmission and reception with the client device.

41. (Withdrawn) A method as recited in claim 39 further comprising monitoring the directed communication beams for the data communication receptions from one or more of the client devices.

42. (Withdrawn) A method as recited in claim 39 further comprising:

maintaining information corresponding to one or more of the client devices, the information including at least one of a transmit power level, a data transmit rate, an antenna direction quality of service data, and timing data; and

wherein coordinating the directed wireless communication includes coordinating a directed wireless communication with a client device based on the information that is maintained.

43. (Withdrawn) A method as recited in claim 39, further comprising generating a directed communication beam as an electromagnetic signal that includes transmission peaks and transmission nulls within a coverage area of the directed communication beam.

44. (Withdrawn) A method as recited in claim 39 further comprising transmitting energy on a side lobe of a directed communication beam corresponding to a first client device such that a second client device will detect the side lobe energy and recognize that a data communication transmission is being emanated to the first client device via the directed communication beam.

45. (Withdrawn) A method as recited in claim 39, further comprising:

determining when a directed communication beam is ineffective for a data communication transmission to a client device; and

routing the data communication transmission to the client device via a second directed communication beam.

46. (Withdrawn) A method as recited in claim 39, wherein coordinating directed wireless communication includes coordinating that only a first client device will receive a first directed wireless communication via a first communication beam, and that only a second client device will receive a second directed wireless communication via a second communication beam.

47. (Withdrawn) A method as recited in claim 39, wherein coordinating directed wireless communication includes coordinating a simultaneous data communication transmission to a first client device via a first directed communication beam and a data communication reception from a second client device via a second directed communication beam.

48. (Withdrawn) A method as recited in claim 39, wherein coordinating directed wireless communication includes coordinating a data communication transmission to a first client device and a data communication reception from a second client device such that the data communication transmission does not interfere with the data communication reception.

49. (Withdrawn) One or more computer-readable media comprising computer executable instructions that, when executed, direct a wireless communication system to:

coordinate directed wireless communication with client devices via directed communication beams emanated from an antenna assembly;

route data communication transmissions through a transmit beam-forming network to antenna elements of the antenna assembly such that a data communication transmission is communicated to a client device via a directed communication beam; and

receive data communication receptions through a receive beam-forming network from the antenna elements of the antenna assembly such that a data communication reception is received from a client device via a directed communication beam.

50. (Withdrawn) One or more computer-readable media as recited in claim 49, further comprising computer executable instructions that, when executed, direct the wireless communication system to;

receive a data communication reception from a client device with a scanning receiver; and

determine which of multiple channels provides acceptable data communication transmission and reception with the client device.

51. (Withdrawn) One or more computer-readable media as recited in claim 49, further comprising computer executable instructions that, when executed, direct the wireless communication system to monitor the directed communication beams for the data communication receptions from one or more of the client devices.

52. (Withdrawn) One or more computer-readable media as recited in claim 49, further comprising computer executable instructions that, when executed, direct the wireless communication system to:

maintain information corresponding to one or more of the client devices, the information including at least one of a transmit power level, a data transmit rate, an antenna direction quality of service data, and timing data; and

coordinate a directed wireless communication with a client device based on the information that is maintained.

53. (Withdrawn) One or more computer-readable media as recited in claim 49, further comprising computer executable instructions that, when executed, direct the wireless communication system to generate a directed communication beam as an

electromagnetic signal that includes transmission peaks and transmission nulls within a coverage area of the directed communication beam.

54. (Withdrawn) One or more computer-readable media as recited in claim 49, further comprising computer executable instructions that, when executed, direct the wireless communication system to:

generate a directed communication beam as an electromagnetic signal that includes a signal transmission peak within a first coverage area and a signal transmission null within a second coverage area; and

generate a second directed communication beam as a second electromagnetic signal that includes a second signal transmission peak within the second coverage area and a second signal transmission null within the first coverage area.

55. (Withdrawn) One or more computer-readable media as recited in claim 49, further comprising computer executable instructions that when executed, direct the wireless communication system to transmit energy on a side lobe of a directed communication beam corresponding to a first client device such that a second client device will detect the side lobe energy and recognize that a data communication transmission is being emanated to the first client device via the directed communication beam.

56. (Withdrawn) One or more computer-readable media as recited in claim 49, further comprising computer executable instructions that, when executed, direct the wireless communication system to:

determine when a directed communication beam is ineffective for a data communication transmission to a client device; and

route the data communication transmission to the client device via a second directed communication beam.

57. (Withdrawn) One Of more computer-readable media as recited in claim 49, further comprising computer executable instructions that, when executed, direct the wireless communication system to coordinate that only a first client device receives a first directed wireless communication via a first communication beam, and that only a second client device receives a second directed wireless communication via a second communication beam.

58. (Withdrawn) One or more computer-readable media as recited in claim 49, further comprising computer executable instructions that, when executed, direct the wireless communication system to coordinate a simultaneous data communication transmission to a first client device via a first directed communication beam and a data communication reception from a second client device via a second directed communication beam.

59. (Withdrawn) One or more computer-readable media as recited in claim 49, further comprising computer executable instructions that, when executed, direct the wireless communication system to coordinate a data communication transmission to a first client device and a data communication reception from a second client device such that the data communication transmission does not interfere with the data communication reception.

60. (Withdrawn) A method, comprising:

associating a client device with a directed communication beam;

receiving signal strength indications for data packets received from the client device;

calculating a signal strength average for the client device from the received signal strength indications; and

maintaining the client device association with the directed communication beam in an event that the signal strength average indicates that the directed communication beam provides an effective communication link.

61. (Withdrawn) A method as recited in claim 60, further comprising:

sampling adjacent signal strength indications of an adjacent directed communication beam;

calculating a second signal strength average for the adjacent directed communication beam;

comparing the signal strength average and the second signal strength average;

maintaining the client device association with the directed communication beam in an event that the signal strength average indicates that the directed communication beam provides a better communication link than the adjacent directed communication beam.

62. (Withdrawn) A method as recited in claim 60, further comprising:

sampling adjacent signal strength indications of an adjacent directed communication beam;

calculating a second signal strength average for the adjacent directed communication beam;

comparing the signal strength average and the second signal strength average;

disassociating the client device from the directed communication beam in an event that the second signal strength average indicates that the adjacent directed communication beam provides a better communication link than the directed communication beam; and

reassociating the client device with the adjacent directed communication beam.

63. (Withdrawn) A method as recited in claim 60, further comprising:

sampling adjacent signal strength indications of an adjacent directed communication beam;

calculating a second signal strength average for the adjacent directed communication beam;

comparing the signal strength average and the second signal strength average;

disassociating the client device from the directed communication beam in an event that the signal strength average indicates that the directed communication beam is an ineffective communication link; and

reassociating the client device with the adjacent directed communication beam in an event that the second signal strength average indicates that the adjacent directed communication beam provides an effective communication link.

64. (New) A Wi-Fi switch comprising:

a multi-beam directed signal system configured for 802.11 specification data packet wireless computing communication with a 802.11 client computing device; and

an antenna assembly configured to receive and emanate wireless communication within a directed beam with the computing device,

wherein the multi-beam directed signal system is configured to determine and adjust, by complementary beam-forming to increase side lobe levels, a transmission peak for a particular directed beam in a non-omni-directional manner based on operational information associated with signal routing and further configured to direct a transmission null in a particular direction to maximize power associated with the transmission peak and minimize interference in the particular direction, and the multi-beam directed signal system is multi-channel and further configured for simultaneous directed wireless computing communication with a second 802.11 client computing device;

the antenna assembly is further configured to emanate the directed communication beam for data communication transmission to the computing device via a first channel; and

the antenna assembly is further configured to emanate a second directed communication beam for data communication reception from the second computing device via a second channel.

65. (New) A method, comprising:

generating from a Wi-Fi switch a directed wireless communication for 802.11 specification data packet communication with a 802.11 client computing device;

receiving the directed wireless communication at an antenna assembly; emanating a directed communication beam, associated with a transmission peak, which is adjusted relative to other beams of a multi-beam directed signal system by complementary beam-forming to increase side lobe levels, in a non-omni-directional manner, for the data communication with the computing device; and

directing a transmission null in a particular direction to maximize power associated with the transmission peak and minimize interference in the particular direction,

transmitting the data communication to the computing device via the directed communication beam adjusted for a transmission peak;

receiving a second data communication from a second computing device via a second directed communication beam; and

wherein transmitting the data communication and receiving the second directed data communication is simultaneous.